

Health Resource Utilization in Patients with Complicated Urinary Tract Infections (cUTI) and Antibiotic Resistance or Treatment Failure: A Retrospective Database Analysis

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ABSTRACT

Background: In the United States, urinary tract infections (UTIs) are predominately treated in the outpatient setting. Resistance to gram-negative bacteria has substantially increased in recent years, however, and many common oral treatment options continue to lose efficacy. As a result, patients may receive multiple courses of antibiotics at various outpatient settings and may ultimately require hospitalization. Here, we quantify health resource utilization and rate of hospitalization in patients with complicated UTI (cUTI).

Methods: A retrospective study was performed in partnership with Komodo Health, Inc., using aggregate data from the Komodo Healthcare Map™ for cUTI-related events. Inclusion criteria: (1) 2+ UTI-related encounters within 35 days, beginning in 2017-2018, (2) clinical/coding features indicative of treatment failure or antibiotic resistance, or treatment with carbapenem or piperacillin/tazobactam. Location of service, number of cUTI-related healthcare encounters, and rate of hospitalization following service location were quantified

Results: 1,889,216 cUTI patients with antibiotic resistance or treatment failure were identified; 1,545,559 were included in the site of care analysis. These patients incurred 8,694,236 cUTI-related healthcare encounters in 2017-2018. In 2017, among 1,105,459 patients, there were 385,981 cUTI-related inpatient hospitalizations, 798,574 emergency department (ED) visits, 285,985 long-term care (LTC) stays, 147,291 home health (HH) visits, and 2,534,083 other outpatient (OP) encounters. For patients with an ED visit, the mean number of visits was 1.67/patient; mean number of LTC, HH, and OP visits were 1.67, 3.07, and 2.97/patient, respectively. Of those who were hospitalized, 38% of patients were hospitalized following an ED encounter; hospitalization rates following LTC, HH, and OP visits were 30%, 43%, and 24%, respectively. The 30-day cUTI-related rehospitalization rate for inpatients was 12%. 2018 data was similar.

Conclusion: cUTI is associated with substantial health resource utilization, the majority of which occurs in the outpatient setting.

**Minor modifications were made to the analytics cohort between abstract submission and poster development, therefore slight variations in the data exist between the original abstract and displayed poster results.*

INTRODUCTION

- Complicated urinary tract infections (cUTIs) are common bacterial infections encountered within both the community and hospital settings
- cUTI accounts for ~3 million annual cases in the United States (US) alone.¹
- Due to increasing lack of effective oral options for multidrug-resistant infections, otherwise healthy patients with UTIs may be hospitalized to receive broad-spectrum IV antibiotics, leading to a 76% increase in incidence of hospitalization for UTI between 1998 and 2011.²
- Up to 34% of patients treated in the ambulatory setting may experience treatment failure and may require subsequent hospitalization.³
- Hospitalizations due to UTIs (>400,000 cases) are estimated to cost the US >\$2.8 billion/year.²
- Direct and indirect medical costs of UTI with prescriptions are estimated to cost the US ~\$1.6 billion/year.⁴

METHODS

The Komodo Healthcare Map™ represents approximately 320 million patient journeys in the United States. It is comprised of 150+ complete payer datasets and over 3.5 million providers. Here, the Komodo Healthcare Map™ was used to identify patients with an ICD-10 code-defined cUTI event in 2017-2018. A cUTI event was defined as a patient with 2+ cUTI-related encounters within 1-35 days. Patients were further defined as having a "resistant" organism if one or more Z-codes indicating resistance were identified on any claim for the patient within the analysis window, and/or as experiencing "treatment-failure" if either of the following conditions were met:

- ≥2 unique treatment claims 3-35 days apart (may be oral, IV, or a combination)
- Any ≥2 IV treatment claims within 35 days

Location of service, number of cUTI-related healthcare encounters, and rate of hospitalization following service location were quantified

RESULTS

- 1,889,216 patients with evidence of treatment failure and/or antibiotic resistance were identified; 1,499,957 (79.4%) were eligible for the site-of-care analysis. (Patient eligibility for cost analyses varied based on data cleaning and availability)
- The mean number of cUTI-related visits per year was 4
- 66% of patients received ≥2 distinct UTI treatments in 2017
 - 27% per year received 1 or more intravenous (IV) treatment in 2017
- 51% of patients were hospitalized each year
- 45% of patients with an inpatient stay in 2017 had another inpatient stay before the end of 2018.
 - 11% were rehospitalized within 30 days of initial hospital admission

Table 1: Common Patient Pathways: % Patients to Next Setting (2017-2018; n=1,499,957)

Current Setting	Next Setting					
	IP	ED	UC	LTC	HOME	OP
IP (n=441,843)	16%	17%	1%	10%	7%	42%
ED (n=756,525)	31%	25%	2%	4%	2%	48%
UC (n=156,024)	3%	10%	35%	5%	0%	62%
LTC (n=268,709)	9%	13%	7%	20%	4%	50%
HOME (n=8,5442)	13%	15%	1%	17%	49%	38%
OP (n=1,218,207)	10%	40%	7%	12%	3%	72%

IP; Inpatient. ED; Emergency Department. UC; Urgent Care. LTC; Long-Term Care. OP; Outpatient.

Figure 1: Number of UTI Treatment Types Received Per Year (2017 only; n=1,303,147)

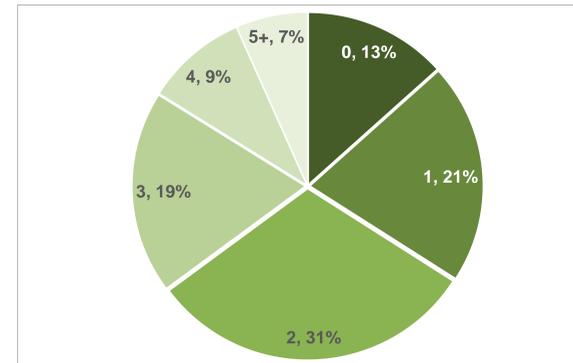


Figure 2: Mean cUTI-related Cost per Visit, by Setting (2017-2018; n=1,429,820)

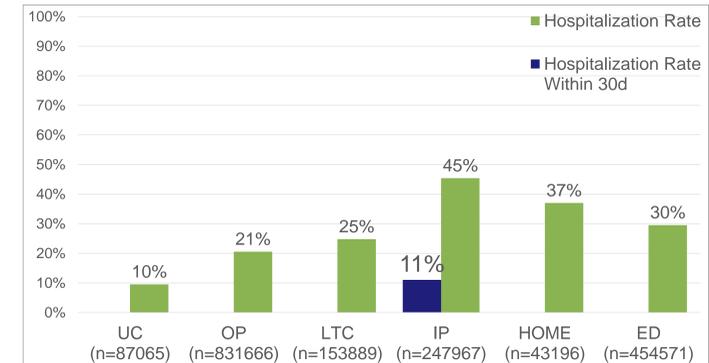


UC; Urgent Care. OP; Outpatient. LTC; Long-Term Care.

CONCLUSIONS

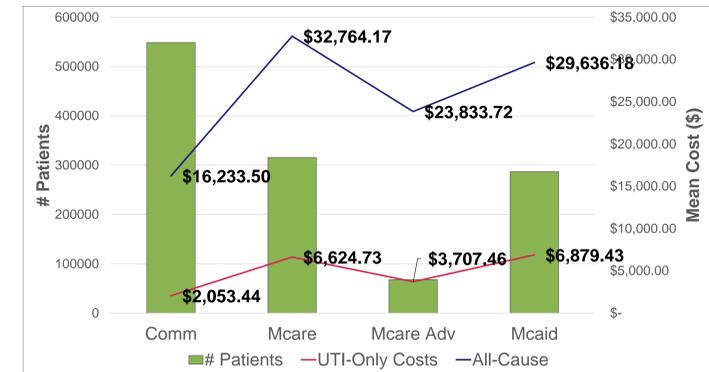
- Across all patients in this cUTI cohort, management for cUTI-related causes accounts for on average ~20% of healthcare spend per year.
- Medicare patients have the highest average cUTI spend per patient per year.
- cUTI is associated with substantial health resource utilization, the majority of which occurs in the outpatient setting.

Figure 3: Hospitalization Rate by Setting of Care (2017 only; n=1,068,173)



UC; Urgent Care. OP; Outpatient. LTC; Long-Term Care. IP; Inpatient. ED; Emergency Department.

Figure 4: Mean cUTI Cost per Year (2017 only; n=1,219,428)



Comm; Commercial. Mcare; Medicare. Mcare Adv; Medicare Advantage. Mcaid; Medicaid

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